
A New Species of *Cyanus* (*Centaurea* p.p.) sect. *Napuliferi* (Asteraceae) from Turkey

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ABSTRACT. A new species of *Cyanus* Miller (*Centaurea* L. p.p.) (Asteraceae), *C. eflanensis* Kaya & Bancheva, is described and illustrated from Karabük Province, Turkey. It belongs to *Cyanus* sect. *Napuliferi* (Stefanoff & T. Georgiev) Bancheva & Raimondo, and taxonomically its closest relative is *C. thirkei* (Schultz Bipontinus) Holub. The habitat and conservation status of the new species are presented, and the morphological characters distinguishing *C. eflanensis* and *C. thirkei* are analyzed and illustrated.

Key words: Asteraceae, Cardueae, *Centaurea*, *Cyanus*, IUCN Red List, Karabük, Turkey.

Centaurea L. s.l. is one of the largest genera in Asteraceae. Depending on the classification used, the genus comprises between 200 and 700 species (Bremer, 1994; Hellwig, 2004; Bancheva & Greilhuber, 2006). Turkey is one of the main centers of diversity for this group (Wagenitz, 1986). Because *Centaurea* s.l. is considered a taxonomically unnatural grouping, recent approaches have split this taxon into several, more natural genera: *Centaurea* s. str., *Cyanus* Miller, *Psephellus* Cassini, and *Rhaponticoides* Vaillant (Greuter, 2003; Hellwig, 2004).

According to Hellwig (2004), the genus *Cyanus* comprises ca. 25 species. In the *Flora of Turkey*, 15 species of *Cyanus* (as *Centaurea* sect. *Cyanus*) were included by Wagenitz (1975). In this paper, we describe a new species, which increases the total number of *Cyanus* known from Turkey to 16 species. There are nine endemic species of *Cyanus* in Turkey; therefore, approximately 56% of this group known from Turkey are endemic taxa.

In Turkey, these *Cyanus* species are found on rocky and grassy slopes, stony calcareous slopes (scree), montane and shrub steppe, alpine and subalpine meadows and pastures, open pine and oak forests and shrub, dry meadows, fields, and roadsides, and range between 500 and 3500 m in altitude.

The taxonomic complexity of *Centaurea* s.l., especially in the Near East, has stimulated much

recent research (Wagenitz, 1983; Kaya, 1986, 1987; Hellwig, 1994; Wagenitz & Hellwig, 1997; Kaya & Vural, 2007).

The new species was collected in 2006 and again in 2007, near the town of Eflani, in Karabük Province in the western Black Sea region of Turkey. These field investigations were part of a joint research project between the Scientific and Technological Research Council of Turkey (TUBITAK) and the Bulgarian Academy of Sciences. Herbarium specimens of the new species and allied taxa are deposited in ISTE and SOM.

***Cyanus eflanensis* Kaya & Bancheva, sp. nov. TYPE:**

Turkey. Karabük (A4): 10 km W of Eflani town, on dry grassy places in open pine forest, 1020–1031 m, 41°20'25.7"N, 32°42'1.9"E, 6 June 2007, Z. Kaya & S. Bancheva 84027 (holotype, ISTE; isotype, SOM). Figure 1.

Haec species *Cyano thirkei* (Schultz Bipontinus) Holub affinis, sed ab eo radice palari simplici (sine radicibus lateralibus) cylindrico-incrassata (1–1.5 cm vs. 0.5–1 cm diam.) usque ad 10 cm (vs. 4 cm) longa, ciliis appendicum phyllariorum 0.9–1.1 mm (nec 2–3 mm) longis margini scarioso 0.2–0.3 mm (nec 1–2 mm) lato insidentibus atque flosculis violaceo-purpureis (nec albidis) differt.

Perennial plants, lacking stolons, with single thickened taproot to 10 cm, ca. 1–1.5 cm diam., abruptly narrowed above into a short, ± horizontal neck; stem single, ascending, 10.5–23 cm tall. Leaves loosely villous, ± glabrescent; lower leaves pinnatifid to pinnatipartite with 2 to 4 pairs of lanceolate segments or entire, usually not forming basal rosette at flowering; median and upper leaves entire to pinnatipartite, sessile. Capitulum single, 1.5–2 cm wide; involucre 11–15 × 8–11 mm; phyllaries elongate-triangular, glabrate; appendages with decurrent, light to dark brown, 0.2–0.3 mm wide scarious margin, with cilia 0.9–1.1 mm. Florets violet-purple; marginal florets radiating, divided into 4 to 6 narrowly

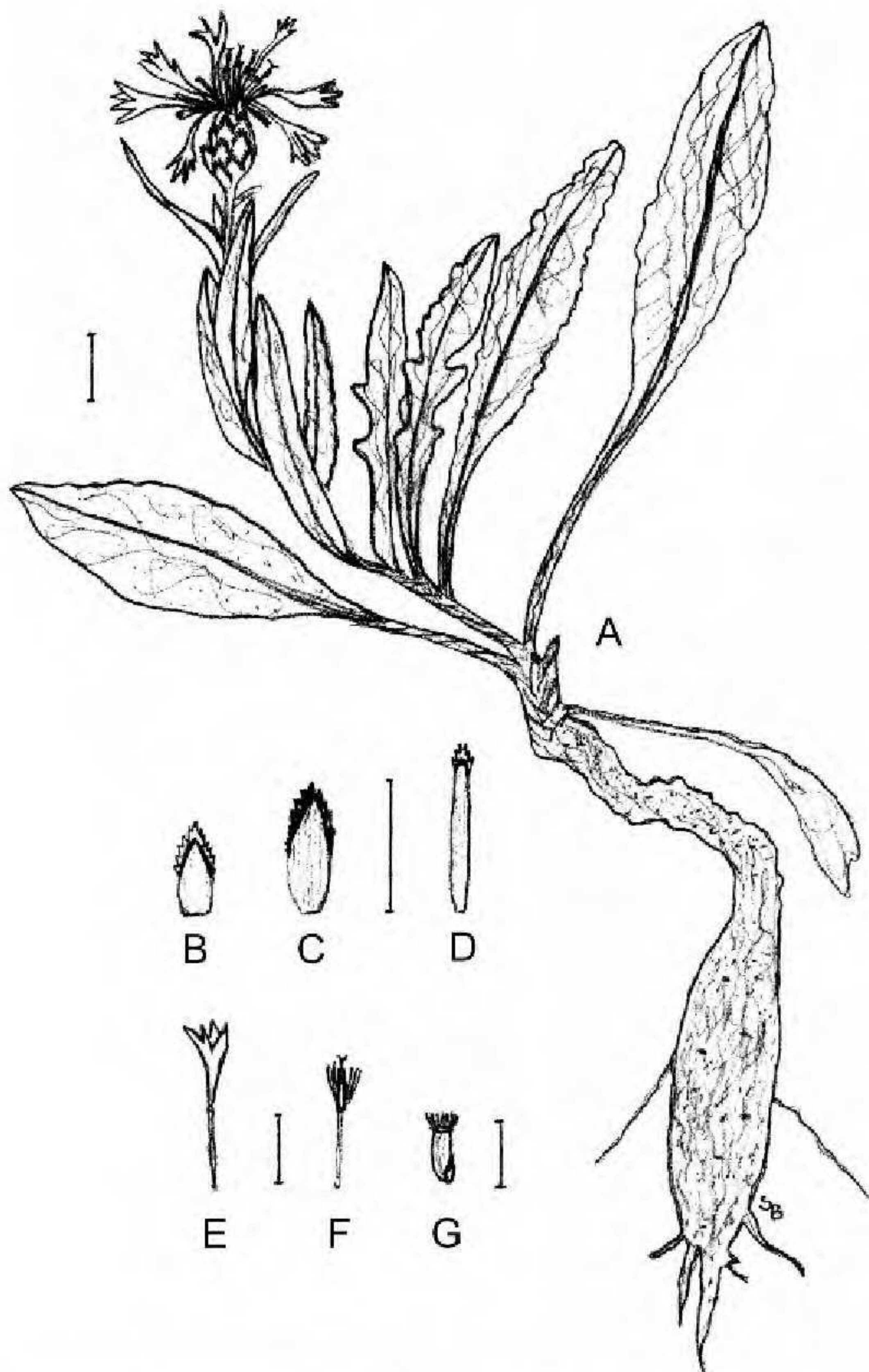


Figure 1. *Cyanus eflanensis* Kaya & Bancheva. —A. Habit. —B. Outer phyllary. —C. Median phyllary. —D. Inner phyllary. —E. Sterile radiant floret. —F. Hermaphrodite tubular floret. —G. Achene. Scale bars: A–F = 1 cm, G = 5 mm. Drawn by S. Bancheva from the holotype Z. Kaya & S. Bancheva 84027 (ISTE).

triangular lobes. Achenes $4\text{--}4.5 \times \text{ca. } 2$ mm, with a basal-lateral elaiosome; pappus $1.1\text{--}1.2$ mm.

Habitat and distribution. The new species is currently known only from one locality in the western

Black Sea region of Turkey. *Cyanus eflanensis* grows in dry grassy areas under the fairly open canopy of a *Pinus nigra* J. F. Arnold forest, on more or less deep soil, between 1020 and 1031 m in elevation. Other associates include *Juniperus oxycedrus* L., *Quercus pubescens* Willdenow, *Ligustrum vulgare* L., *Pyracantha coccinea* M. Roemer, *Pyrus elaeagnifolia* Pallas, *Briza media* L., *Cephalanthera rubra* (L.) Richard, *Dactylis glomerata* L., *Inula ensifolia* L., *Iris kerneriana* Ascherson & Sintenis ex Baker, *Jurinea consanguinea* DC., *Lotus corniculatus* L., *Muscari tenuiflorum* Tausch, and *Scabiosa ochroleuca* L.

IUCN Red List category. The new species is endemic to the western Black Sea region of Turkey. The specimens were collected in Karabük Province (A4), where the species is apparently very rare and local. *Cyanus eflanensis* is known only from one population in the type locality occupying an area of 1000 m^2 . The population was not in good condition at the time of our fieldwork, numbering approximately 150 to 200 plants. According to IUCN Red List criteria (IUCN, 2001), it should be assigned to the Critically Endangered (CR) category because of its local distribution and small population size.

Phenology. The new species was collected in flower June–July and in fruit in July.

Etymology. The species epithet recognizes the town of Eflani, the type locality of the new species.

Relationships. *Cyanus eflanensis* belongs to section *Napuliferi* (Stefanoff & T. Georgiev) Bancheva & Raimondo. The group is well characterized by its thickened, spindle-shaped or turnip-shaped roots, and relatively small leaves, often with a deeply cut blade and white woolly indumentum (Bancheva & Raimondo, 2003). Based on morphology, the closest ally of *C. eflanensis* is *C. thirkei* (Schultz Bipontinus) Holub, which has a broader distribution, occurring in

Table 1. Morphological comparison of selected characters used to distinguish *Cyanus eflanensis* and *C. thirkei*.

	<i>C. eflanensis</i>	<i>C. thirkei</i>
Root type and size	single thickened taproot, to $10 \times 1\text{--}1.5$ cm	taproot with (1 to)2 to 4(to 5) thickened, napiform or fusiform lateral roots, to $2\text{--}4 \times 0.5\text{--}1$ cm
Stem height (cm)	10.5–23	5–10(–15)
Involucrum size (mm)	$11\text{--}15 \times 8\text{--}11$	$16\text{--}20 \times 10\text{--}15$
Phyllary appendages: length of marginal cilia (mm)	0.9–1.1	2–3
Phyllary appendages: width of scarious margin without cilia (mm)	0.2–0.3	1–2
Achene length (mm)	4–4.5	3–4(–4.5)
Pappus length (mm)	1.1–2.2	1–1.2
Color of florets	violet-purple	whitish
Habitat	<i>Pinus nigra</i> forest	dry grassy and rocky places
Flowering	June–July	March–June

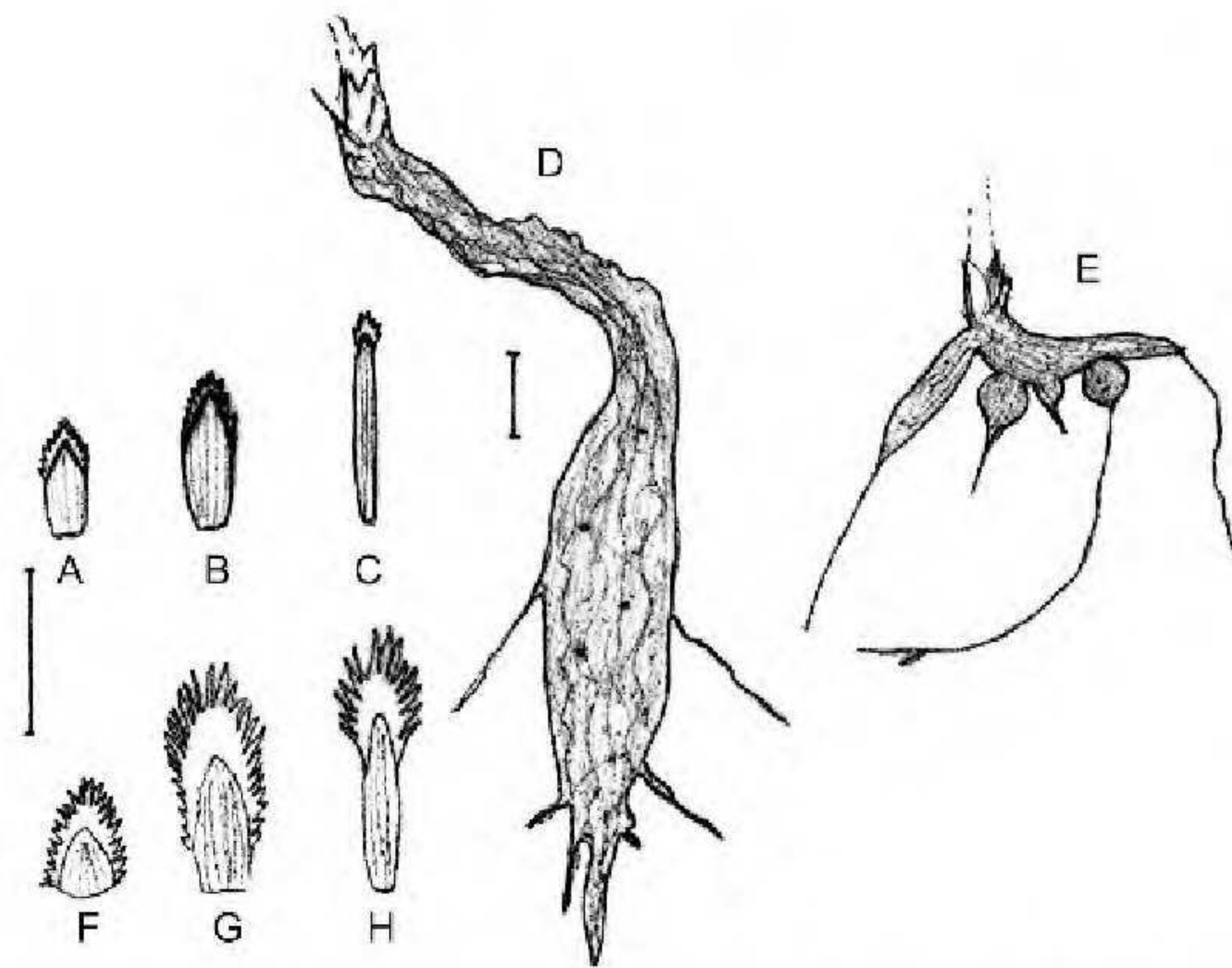


Figure 2. Comparison of phyllaries and roots. A–D. *Cyanus eflanensis* Kaya & Bancheva. —A. Outer phyllary. —B. Median phyllary. —C. Inner phyllary. —D. Root. E–H. *C. thirkei* (Schultz Bipontinus) Holub. —E. Root. —F. Outer phyllary. —G. Median phyllary. —H. Inner phyllary. Scale bars: 1 cm. Drawn by S. Bancheva; A–D from the holotype Z. Kaya & S. Bancheva 84027 (ISTE), E–H from Z. Kaya & S. Bancheva 84914 (SOM).

Bulgaria, Moldavia, and Turkey. The distribution of *C. thirkei* in Turkey is confined to the Mediterranean-climate area of western Turkey (A1, B1, B2, B3, C2 and C3) (Wagenitz, 1975), so the two mentioned taxa are allopatric.

The authors studied pertinent specimens and published descriptions (Wagenitz, 1975; Dostal, 1976; Bancheva & Raimondo, 2003) and determined that *Cyanus eflanensis* and *C. thirkei* differ morphologically (Fig. 2, Table 1). The diagnostic characters are contrasted in the following key couplet.

KEY TO TWO *CYANUS* SPECIES IN TURKEY

- 1a. Plant with (1 to)2 to 4(to 5) thickened adventitious roots, to 4 × 1 cm; florets usually whitish . . . *C. thirkei*
1b. Plant with a single thickened taproot, to 10 × 1–1.5 cm; florets violet-purple *C. eflanensis*

Paratypes. TURKEY. **Karabük (A4):** 10 km W of Eflani town, on dry grassy places in open pine forest, 1020–1031 m, 41°20'25.7"N, 32°42'1.9"E, 8 July 2007, Z. Kaya & S. Bancheva 86016 (ISTE, SOM).

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